General Specifications

Item	Specification
Base ignition timing	10 degrees ± 2 degrees non-adjustable
Firing order	1-3-7-2-6-5-4-8
Spark plug gap mm (in)	1.32-1.42 (0.052-0.056)
Spark plug type	AWSF-32PP

Torque Specifications

Description	Nm	lb-ft	lb-in
Spark plugs	15	11	—
Coil on plug bolts	10	—	89

Engine Ignition

Eight separate ignition coils (12029):

- are mounted directly above each spark plug (12405).
- are controlled by the powertrain control module (PCM) for correct firing sequence.

The spark plug:

- changes the high voltage pulse into a spark which ignites the fuel and air mixture.
- originally equipped on the vehicle has a platinum-enhanced active electrode for long life.

Crankshaft position (CKP) sensor (6C315):

NOTE: Initial engine ignition timing is set at 10 degrees ± 2 degrees before top dead center (BTDC) and is not adjustable. For additional information, refer to the Powertrain Control/Emissions Diagnosis (PC/ED) manual.

- is a variable reluctance sensor triggered by a 36-minus-1 tooth trigger pulse wheel located on the crankshaft (6303) inside the engine front cover (6019).

The sine wave type signal generated from the crankshaft position sensor provides two types of information:

- position of the crankshaft in 10 degree increments
- the crankshaft speed (rpm)

The powertrain control module (PCM) (12A650) uses this information to determine ignition coil turn ON and turn OFF times and misfire detection.

For additional information, refer to Section 303-14 .

Engine Ignition

Refer to the Powertrain Control/Emissions Diagnosis (PC/ED) manual.

Ignition Coil —Coil On Plug

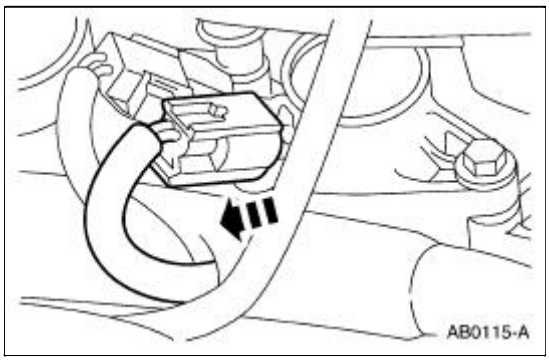
Removal

1. Disconnect the battery ground cable (14301). For additional information, refer to Section 414-01 .

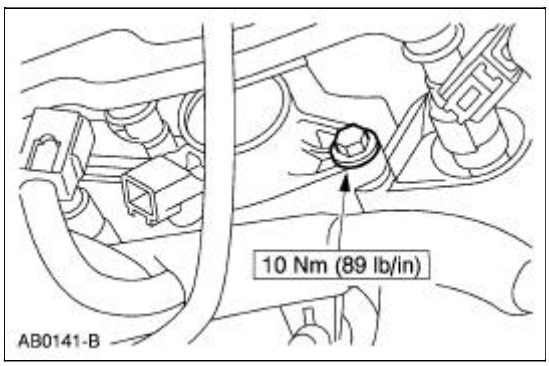
2. Remove the air cleaner outlet tube (9B659). For additional information, refer to Section 303-12 .

3. **NOTE:** One ignition coil is shown, and the others are similar.

   Disconnect the connector from the ignition coil (12029).



4. Remove the bolt and the ignition coil.



Installation

1. **NOTE:** Verify the ignition coil spring is correctly located inside the ignition coil boot and there is no damage to the tip of the boot.

   To install, reverse the removal procedure.

Spark Plug

Removal

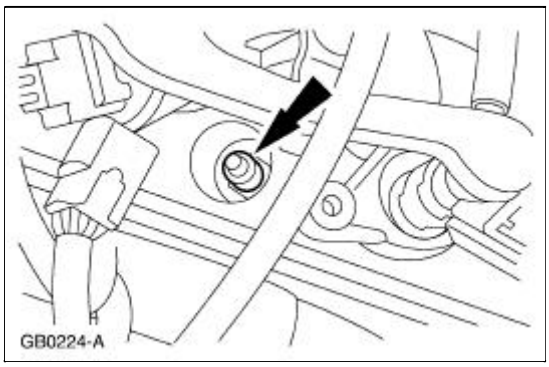
1. Remove the ignition coil on plug. For additional information, refer to Ignition Coil—Coil On Plug in this section.

2. **NOTE:** Use compressed air to remove any foreign material from the spark plug well before removing the spark plugs (12405).

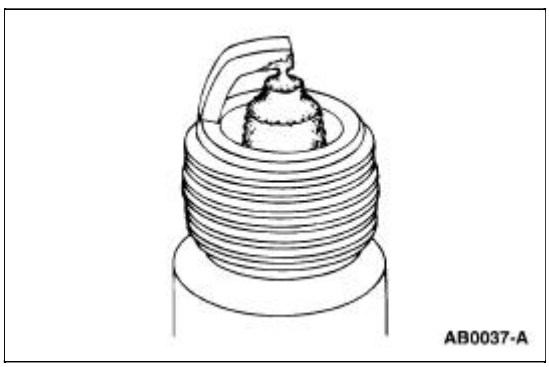
   NOTE: If an original spark plug is used, make sure it is installed in the same cylinder from which it was taken. New spark plugs can used in any cylinder.

   NOTE: One spark plug is shown; others are similar.

   Remove the spark plugs

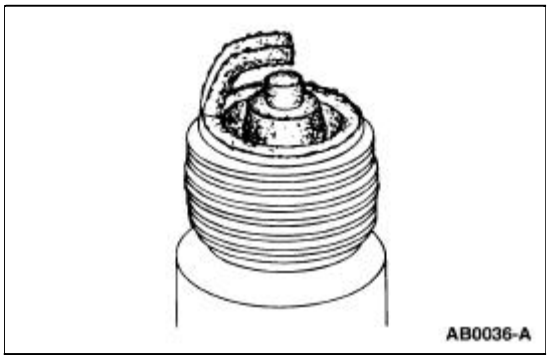


3. Inspect for gap bridged.
   - This can be identified by a deposit build up closing the gap between electrodes.
   - This can be caused by oil or carbon fouling.
   - Clean the spark plug.

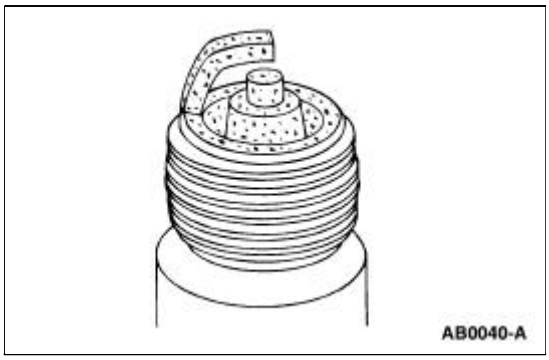


4. Inspect for oil fouling.
   - This can be identified by wet black deposits on the insulator shell bore electrodes.
   - This can be caused by excessive oil entering the combustion chamber through worn rings and pistons, excessive clearance between valve guides and stems, or worn or loose bearings. Correct the oil problem.

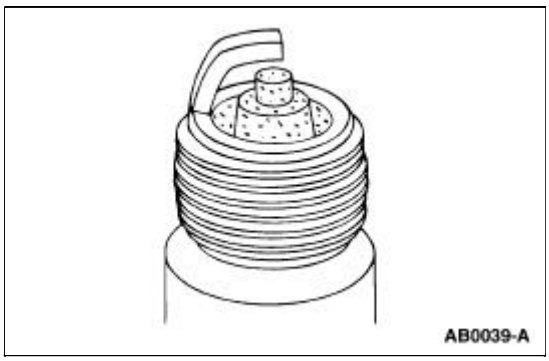
- Install a new spark plug.



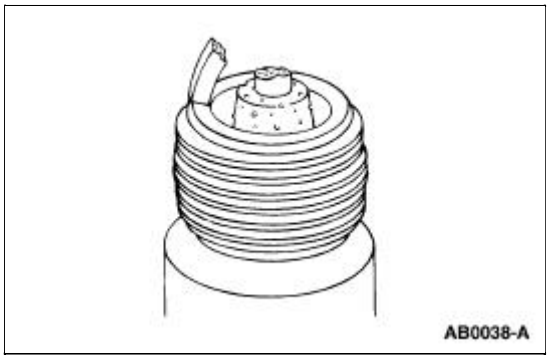
5. Inspect for carbon fouling.
    - This can be identified by black, dry fluffy carbon deposits on insulator tips, exposed shell surfaces and electrodes.
    - This may be caused by too cold a plug, dirty air cleaner, damaged fuel pump, too rich a fuel mixture or excessive idling.
    - Clean the spark plug.



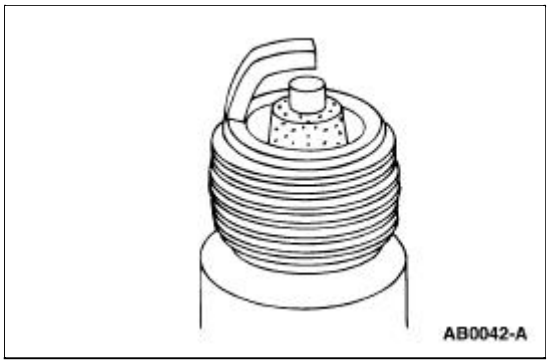
6. Inspect for normal burning.
    - This can be identified by light tan or gray deposits on the firing tip.



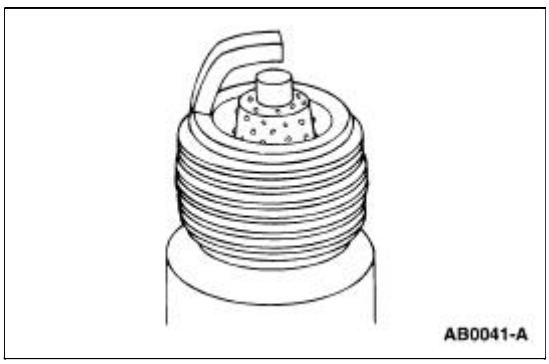
7. Inspect for pre-ignition.
    - This can be identified by melted electrodes and possibly a blistered insulator. Metallic deposits on insulator indicate engine damage.
    - Install a new spark plug.



8. Inspect for overheating.
    - This can be identified by a white or light gray insulator with small black or gray brown spots and with bluish-burnt appearance of the electrodes.
    - This may be caused by engine overheating, wrong type of fuel, loose spark plugs, too hot a plug, low fuel pump pressure or incorrect ignition timing.
    - Install a new spark plug.

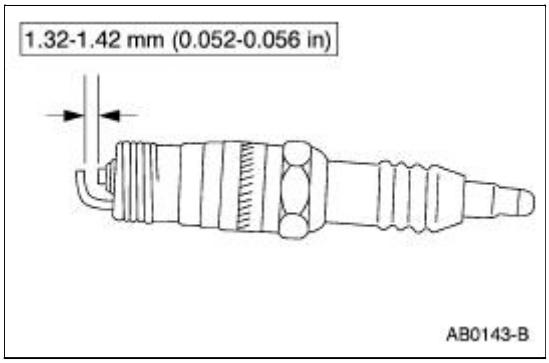


9. Inspect for fused spot deposits.
    - This can be identified by melted or spotty deposits resembling bubbles or blisters.
    - This may be caused by sudden acceleration.
    - Clean the spark plug.



Installation

1. Adjust the spark plug gap as necessary.



2. To install, reverse the removal procedure.